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13. ABSTRACT *(Maximum 200*

This retrospective study is designed to provide an assessment of the risk of recurrence and death associated with pregnancy following primary and adjuvant breast cancer treatment. This major concern of young breast cancer patients who may have delayed childbearing. A collaborative record-linkage study is underway using the unique computerized records maintained by the Kaiser Permanente of Northern California. Through linkage of the cancer registry and hospitalization records, young breast cancer patients with a history of subsequent pregnancy have been identified. Medical record review is currently being conducted to collect data on epidemiologic risk factors and breast cancer stage, treatment and outcome factors. Four breast cancer cases without a history of pregnancy after breast cancer will be matched to each case by year and age at diagnosis, stage of disease, months of survival from diagnosis to first pregnancy outcome, and disease status during early pregnancy. Matched analyses methods will be used to compare disease-free survival among cases with and without a history of subsequent pregnancy. Known and suspected prognostic factors will be controlled in the analysis. Among cases with a history of subsequent pregnancy, the effect of reproductive events prior to diagnosis, the months between diagnosis and first pregnancy, the number of subsequent pregnancies, and birth outcomes will be studied. The unique data resources of KPMCP provide an opportunity to conduct an efficient and comprehensive study of the safety of subsequent pregnancy augmenting the limited information currently available.

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Ruby T. Lewis (RL) 10/13/97

PI - Signature Date

Senie, Ruby T

DOES SUBSEQUENT PREGNANCY INFLUENCE BREAST CANCER SURVIVAL?

TABLES OF CONTENTS

DOES SUBSEQUENT PREGNANCY INFLUENCE BREAST CANCER SURVIVAL?

INTRODUCTION:

Approximately 36,000 American women younger than age 45 will be diagnosed with breast cancer during 1997 (1). With many women delaying childbearing until their 30's, an increasing number of young women are being diagnosed with the disease who wish to initiate childbearing or extend their families after completing breast cancer treatment. Recently, patients have taken a more active role in treatment decision-making and are encouraging more research to assess the effect on survival of pregnancy following breast cancer treatment (2).

With the longstanding recognition of the hormonal dependency of breast cancer, clinicians often cautioned against pregnancy after breast cancer. In addition, some research supports improved survival among premenpausal breast cancer patients following bilateral oophorectomy (3). In addition, multidrug adjuvant chemotherapy often results in loss of regular menstrual cycles which may be temporary or permanent. Some of the benefit of chemotherapy appears to result from an endocrine effect. However, a modification in adjuvant protocols to less toxic chemotherapy of shorter duration, more women appear to be retaining or regaining menstrual cycles. Several authors have noted that permanent suppression of ovarian function varies by age (4,5). Some women retain regular menses; others who have experienced temporary amenorrhea may subsequently be able to conceive (6,7) and some patients have become pregnant while receiving chemotherapy (8). Other studies have shown regular menstrual cycles have been reestablished with a return of fertility years after completion of treatment (9,10). Tamoxifen, one of the most frequently prescribed hormonal agents, has been found to stimulate ovulation in some women, potentially enhancing the likelihood of pregnancy in the absence of contraception.

Some women are pregnant at the time of diagnosis. This combination of events results in complex clinical decision making which differs considerably from the concern about the safety of pregnancy after primary and adjuvant breast cancer treatment (11-13). Several recent reports using computerized data files in countries with nationalized health records have indicated no adverse effect of subsequent pregnancy. However, these prospective analyses could not rule out selection bias; one report noted the 'healthy mother effect' implying that only those young patients free of recurrent disease would be considering pregnancy (14,15).

Physicians tend to be cautious when asked by their patients about their desire to become pregnant because of the concern that the hormonal elevations of pregnancy may stimulate latent foci of carcinoma creating an unnecessary risk of disease recurrence (16); others have hypothesized that estrogen metabolism during pregnancy may have a protective effect of on breast cancer prognosis (17). Hormonal studies of breast cancer patients prior to tumor excision have revealed reduced estriol levels, a combined effect of estrogen and estradiol. During pregnancy estriol, a weak estrogen, is elevated

1,000 times while estrone and estradiol are at significantly lower levels. Therefore, proliferation of cancer cells may be restricted during pregnancy potentially reducing the development of metastases. Estrogen and progesterone receptors of the primary tumor have been studied to assess the effect of hormonal treatment on the risk of recurrence and to estimate tumor responsiveness to hormonal changes associated with pregnancy. Unfortunately, receptor data is rarely included in population based cancer registries and not able to be considered in the recently published prospective studies.

The suggested safe interval between primary breast cancer treatment and pregnancy for women with extensive disease at diagnosis varies considerably among investigators; recommendations ranged from six months to ten years (16,17). One investigator reported no adverse effect of subsequent pregnancy in such patients even when the interval between breast cancer and conception was 6 months (38). Since risk of recurrence may differ by age and stage at diagnosis as well as the length of delay before first post-treatment pregnancy, more research is needed to define optimal intervals for subsets of patients.

Two physician surveys published 40 years apart assessed clinical recommendations for pregnancy after primary breast cancer treatment (18,19). In 1953 Cheek noted most physicians thought subsequent pregnancies should be avoided (18). Little consensus exists today according to the 1993 publication of Saunders and Baum; most British physicians surveyed did not know if subsequent pregnancy would have an adverse effect on breast cancer prognosis (19).

The uncertainty expressed by clinicians reflects the limited data available from published reports which hesitantly imply subsequent pregnancy does not adversely affect survival. The proposed retrospective population-based study will yield a sufficient number of breast cancer patients with a history of subsequent pregnancy and a large population of cases without post-treatment pregnancy for the assessment of comparative survival. Mulvihill and colleagues suggested the establishment of an multi-institutional registry in order to assess the effect of adjuvant therapy on pregnancy outcome (5). Dr. Jeanne Petrek, a member of Breast Service, Department of Surgery, Memorial Sloan Kettering Cancer Center, and colleagues are establishing a prospective study of young breast cancer patients. Breast cancer patients younger than 44 at diagnosis will be enrolled in three geographic regions to the study of survival in relation to ovarian function and subsequent pregnancy. Meaningful results from the prospective study will not be available for 5 to 10 years.

Since the psychological well-being of young breast cancer patients and their sense of normality after treatment may be strongly associated with childbearing (2), oncologists have frequently been asked by young patients if and when pregnancy is safe. Clinicians have been cautious in recommending pregnancy after breast cancer because of the recognized poor outcome of women diagnosed with breast cancer **during** pregnancy. However, the potential hormonal stimulation of pregnancy may not influence the natural history of breast cancer in a homogeneous manner. Stage of disease at diagnosis, type and duration of adjuvant chemotherapy and hormonal therapy, as well as estrogen and progesterone receptor status, are established prognostic factors. In addition, age at diagnosis, prior pregnancy history, and genetic susceptibility to breast cancer may modify the risk of disease dissemination following subsequent pregnancy. Current therapeutic modalities are less toxic, of shorter duration and improve

prognosis; however, the quality of survival time may be enhanced by knowledge that the resumption of normal reproductive patterns will not adversely affect long term survival. If the safety of subsequent pregnancy can be assured, the quality of survival time may be enhanced by knowledge that the resumption of normal reproductive patterns will not adversely affect long term survival.

BODY:

Overview of Scope of Work

This retrospective study is designed to assess the impact of subsequent pregnancy on breast cancer prognosis among women diagnosed before the age of 45. The study is a collaborative effort conducted by researchers of the Kaiser Permanente Medical Care Program (KPMCP) facilities in Northern California with investigators in New York. The databases maintained by the KPMCP Division of Research provide a unique opportunity to identify young breast cancer patients and to follow their course of therapy and outcome through review of their medical records.

The work scope of the project includes:

1. Identification of breast cancer patients age 44 or less at diagnosis recorded in the KPMCP cancer.

2. Linkage of the cases with birth records to identify women who have had one or more subsequent pregnancies after breast cancer diagnosis. Dates of diagnosis and pregnancy outcome are being compared in order to eliminate women who were pregnant at the time of diagnosis of breast cancer. Only pregnancies initiated after diagnosis are being included.

2. Matching each case with a positive history of subsequent pregnancy to four breast cancer patients without a history of subsequent pregnancy. Matching criteria include:
    a) age at diagnosis (+/- 3 years)
    b) year of diagnosis (+/- 3 years)
    c) stage at diagnosis
    d) months of survival from diagnosis to first subsequent pregnancy
    e) disease status during the early trimester of the first subsequent pregnancy

3. Abstract data from medical records retained in outpatient and inpatient KPMCP facilities using specially designed data collection instrument to obtain demographic and health history information including:
    a) prior pregnancy history
    b) family history of breast cancer
    c) stage of breast cancer at diagnosis
    d) primary and adjuvant treatment information.

4. Perform matched statistical analyses to compare the risk of recurrence and death due to breast cancer of women with a positive history of subsequent pregnancy with matched cases who did not have a post-treatment pregnancy.

5. If the number of cases with a positive history of post-treatment pregnancy permit, analyses of recurrence and death due to breast cancer will be studied in relation to:

a) the interval between diagnosis and first post-treatment pregnancy
b) the number of post-treatment pregnancies
c) pregnancy outcomes: births, spontaneous miscarriages, and/or induced abortions
d) neonatal outcomes in relation to patient and treatment characteristics

Sources of Data for the Research Project

Kaiser Permanente Medical Care Program (KPMCP) of Northern California, a group practice prepaid health plan and the largest health maintenance organization in the country, is providing access to several computerized data sets that are being used in this project. Record linkage between data sets is accomplished with a unique life-long medical record number assigned to each member at the time of initial enrollment. The nested case-case comparison study will be conducted within the population of breast cancer cases identified through linkage of the following data sets: Kaiser Membership File, Kaiser Permanente Regional Cancer Registry, Kaiser Permanente Regional Hospitalization Registry, California Automated Mortality Linkage and Information System, and Kaiser System Medical Records.

Current Status of Research Project

Preparations to begin the research activities at Kaiser began soon after the awarding of support from the U.S. Army Medical Research Acquisition Activity. As proposed in the timeline of the Statement of Work included in the application, the first three months were devoted to refining the study protocol and working with the computer programmer at Kaiser to confirm the number of cases meeting the initial criteria for inclusion in the study.

The principal investigator, Dr. Senie, visited Kaiser on three occasions. During the initial visit she met with key members of the Kaiser Division of Research and spent time with the Project Coordinator, Barbara Anglin. Before developing a draft of data collection instrument, several medical records were reviewed to acquaint Ms Anglin and Dr. Senie with the organization of the medical charts and the location of the essential records including pathology reports, treatment records and birth notations. Conference calls and email communication as well as faxes of draft instruments preceded the second in person visit. The draft instrument was used with five records of breast cancer cases who met the age and subsequent pregnancy criteria for inclusion.

Following this extensive review of each record, changes to the data collection instrument were made. The most important addition was the recognition that some breast cancer patients may have had pelvic surgery before or during their breast cancer treatment that may have affected their ability to become

pregnant. In addition, some women were pregnant at the time of breast surgery but chose to have an induced abortion. This information is not computerized but was identified through medical record review. A copy of the final data collection form is included in the Appendices. Ms Anglin has worked with the data management division of the Kaiser Division of Research to create the data entry program for this project.

The medical record analyst was hired, as planned, in the tenth month of the study after the instrument prior to Dr. Senie's third visit to the Kaiser Division of Research. Careful training of Ms. Judith Tallman, the medical record analyst, assigned to this study will be conducted to insure consistency of data collection and interpretation over time. Reproductive factors preceding breast cancer diagnosis will be recorded as well as pregnancy history during and after primary therapy to insure exclusion of cases with co-existing pregnancy and breast cancer. Birth outcomes, including condition of the newborn, and determine cause of death for breast cancer cases who have died will be recorded. To determine if the cause of death was breast cancer, medical records and death certificates will be carefully reviewed to locate evidence of recurrent disease prior to death. Dr. Senie spent three days working closely with Ms Anglin and Ms. Judith Tallman to review the essential components of the medical records, their location in the medical chart, and interpretation of complexities requiring special attention. Ten charts were obtained for review and completion of the data forms by Ms. Tallman which were subsequently reviewed by Ms. Anglin and Dr. Senie.

The initial computer search identified 89 women diagnosed with breast cancer aged 44 or younger through 1991 who had a link with the hospital admission file indicating one or more subsequent pregnancies. Additional cases with a positive history of subsequent pregnancy are anticipated when women diagnosed between 1992 and 1995 are identified. Cases must have been members of KPMCP at the time of breast cancer diagnosis at a KPMCP facility. During medical record review the date of breast cancer diagnosis is being verified; dates of diagnosis and pregnancy outcome are compared to eliminate women who were pregnant at the time of diagnosis of breast cancer. Only pregnancies initiated after diagnosis are included. Of the 89 cases already identified, the records of 55 breast cancer cases have been reviewed and the data form completed.

Figure 1 in the Appendices presents the current status of the research project and the sequence of tracking events that will follow initial data collection on the total number of cases with one or more subsequent pregnancies. Four breast cancer patients who did not became pregnant after primary cancer treatment will be matched to each woman with a positive history of subsequent pregnancy. Cases without linkage to pregnancy records will be over sampled by 25% in order to eliminate any cases found, during medical record abstracting, to have a prior history that would have prevented subsequent pregnancy such as bilateral oophorectomy, hysterectomy or other gynecologic or endocrine conditions affecting menstrual regularity, a surrogate measure of fertility. Some cases may be found during medical record abstracting to have a history of spontaneous miscarriage or induced abortion that did not require hospitalization. These cases will be added to the subset with a positive history of subsequent pregnancy. For any case subjects found through record review to have a positive post-treatment pregnancy, four control cases will be selected from the cohort with a negative history.

Medical record review of all study subjects will supplement computerized follow-up information. Known or suspected breast cancer prognostic factors are being abstracted. In addition, any pelvic surgery that may have prevented subsequent pregnancy will be assessed in order to exclude such cases from the matched comparison sample patients without a history of subsequent pregnancy. Essential data from medical records includes stage of breast cancer at diagnosis, cancer treatment, and disease status during follow-up.

Matched analyses will be conducted to compare survival among cases with and without a history of subsequent pregnancy. Potential prognostic factors, not included as matching variables, such as prior pregnancy history and family history of breast cancer, will be controlled in the analysis. Analyses among cases with a positive history will address prognostic differences by age at diagnosis and age at subsequent pregnancy. If the number of cases with a positive history of subsequent pregnancy permits, the length of the interval between diagnosis and first subsequent pregnancy, pregnancy outcome, and number of post treatment pregnancies will be studied in relation to survival.

Statistical Procedures

The analytic procedures that will be applied to the data for this study will compare risk of recurrence and death due to breast cancer among cases with and without a subsequent pregnancy history. If sufficient cases with a positive post treatment pregnancy history are identified, survival differences related to months between diagnosis and first post-treatment pregnancy, total number of pregnancies, and pregnancy outcomes will also be assessed. An additional analysis of interest will focus on pregnancy related events among cases with a positive history; complications of pregnancy and presence of any fetal abnormalities, detectable at birth.

The primary analysis of interest is the assessment of risk of recurrence and death due to breast cancer among women with and without a history of subsequent pregnancy Cox proportional hazards survival models will be applied. Prognostic factors that influence breast cancer survival will be controlled in the models. These include tumor characteristics, especially estrogen and progesterone receptor levels of the primary tumor, which may influence the impact of pregnancy on the course of breast cancer. Survival time will be measured from the time of first pregnancy until disease recurrence and death due to breast cancer. Cases will be censored at date of death due to causes other than breast cancer or date last known alive. Whether pregnancy affects survival will be assessed using the analysis of paired failure times. The primary regression coefficient will be obtained by allowing each matched pair to define a new stratum; the analysis is based on within pair data. The hazard function for the sth pair under the proportional hazards model is

$$\lambda\,(t;\, Z(t),s) = \lambda_{0s} \exp[Z(t)\beta]$$

Included in the vector Z(t) are the matching variables and the covariates of treatment regimen received. Additional variables to be entered in the model include: ER and PR Receptor status, stage and treatment

modalities, prior pregnancy history, and family history of breast cancer. Interaction effects will also be considered. When a second breast cancer occurs after pregnancy, it will be handled as a time dependent variable. A partial likelihood will be formed over the pairs of the conditional probability for the "pair rank" given the smallest failure time in the sth pair. The same analytic methods will be used to assess risk of disease recurrence and risk of death due to breast cancer.

Power Calculations

Estimates of power for the primary analysis are conservatively estimated using 50 cases with a positive subsequent pregnancy history and 200 matched comparison cases. With an estimated range of percent survival of 70% two years after diagnosis to 40% five years after diagnosis based on published mortality data, the hazard ratios detectable with 90% power and 0.05 level of significance ranges from 1.9 to 2.5.

Previous Work And Experience of The Study Team

Experience of Collaborators The proposed study of the influence of pregnancy after breast cancer treatment on breast cancer survival combines the talents of researchers affiliated with Columbia University School of Public Health, Kaiser Permanente Medical Care Program (KPMCP) of Northern California and Memorial Sloan Kettering Cancer Center. **Dr. Ruby T. Senie**, who recently joined the faculty of the Columbia School of Public Health, initiated the study with **Dr. Robert A. Hiatt**, who is Principal Investigator of the subcontract with Kaiser Permanente Division of Research. Dr Hiatt has conducted many studies at Kaiser including etiologic investigations requiring long term follow-up. **Dr. Jeanne Petrek**, who has assumed the role of Principal Investigator at Memorial Sloan Kettering Cancer, conducted one of few studies in the literature addressing prognosis of breast cancer associated with pregnancy. This study of 63 patients, who were diagnosed with breast cancer during pregnancy, revealed surprisingly poor survival of 8 patients who became pregnant again after completion of breast cancer treatment. Although the combination of pregnancy at the time of diagnosis and pregnancy following breast cancer treatment may be an unusual combination of events, these reproductive events associated with breast cancer may be occurring with greater frequency due to delayed childbearing and decreasing age at diagnosis of breast cancer especially among women at increased risk.

Dr. Petrek, in collaboration with surgical colleagues from several other comprehensive cancer centers, has been funded to conduct a prospective study assessing menstrual changes and effects on fertility among young breast cancer patients as well as the safety of subsequent pregnancy. **Dr. Ann G. Zauber**, Co-Investigator of the study, is an Associate Member of the Department of Epidemiology and Biostatistics of Memorial Sloan Kettering. She has extensive experience in health services research, cancer control, and epidemiology. Dr. Zauber has participated in numerous case-control studies of breast cancer epidemiologic risk factors.

Dr. Audery F. Saftlas, Ph.D, M.P.H., a consultant to the proposed study, is an Assistant Professor in the Department of Epidemiology and Public Health of the Yale School of Medicine. She has published

extensively in both breast cancer research and reproductive epidemiology. Dr. Saftlas will provide guidance in studying the pregnancy complications and birth outcomes among the breast cancer cases with a history of subsequent pregnancy

CONCLUSIONS:

Limited research has addressed the influence of pregnancy after breast cancer on prognosis of disease. Due to current trends of delayed childbearing, an increasing number of young breast cancer patients may wish to initiate childbearing or extend their families after diagnosis. A collaborative record-linkage study is being conducted by researchers of Columbia University School of Public Health, Memorial Sloan Kettering Cancer Center and the Kaiser Permanente Medical Care Program (KPMCP) of Northern California. The unique computerized KPMCP cancer files (SEER records since 1973) have been linked with KPMCP hospitalization records to identify breast cancer cases age 44 or younger who were subsequently hospitalized for pregnancy related events. Current research activities at Kaiser are focused on identifying all cases with subsequent pregnancy meeting entry criteria. When the cohort of cases with a positive pregnancy history is completed, four breast cancer cases without a history of pregnancy after breast cancer will be matched to each case by year and age at diagnosis, stage of disease, months of survival from diagnosis to first pregnancy outcome, and disease status during early pregnancy. Medical record abstracting for all study subjects is providing prognostic data including stage and treatment information, family history of breast cancer and pregnancy outcomes before and/or after diagnosis. Analytic procedures for matched analyses will be applied to compare disease-free survival among cases with and without a history of subsequent pregnancy. Known and suspected prognostic factors will be controlled in the analysis. Among cases with a positive history of subsequent pregnancy, the prognostic effect of reproductive events prior to diagnosis, the number of months between diagnosis and first pregnancy, the total number of subsequent pregnancies, and birth outcomes will be studied. The unique data resources of KPMCP provide an opportunity to conduct an efficient and comprehensive study of the safety of subsequent pregnancy augmenting the limited information currently available

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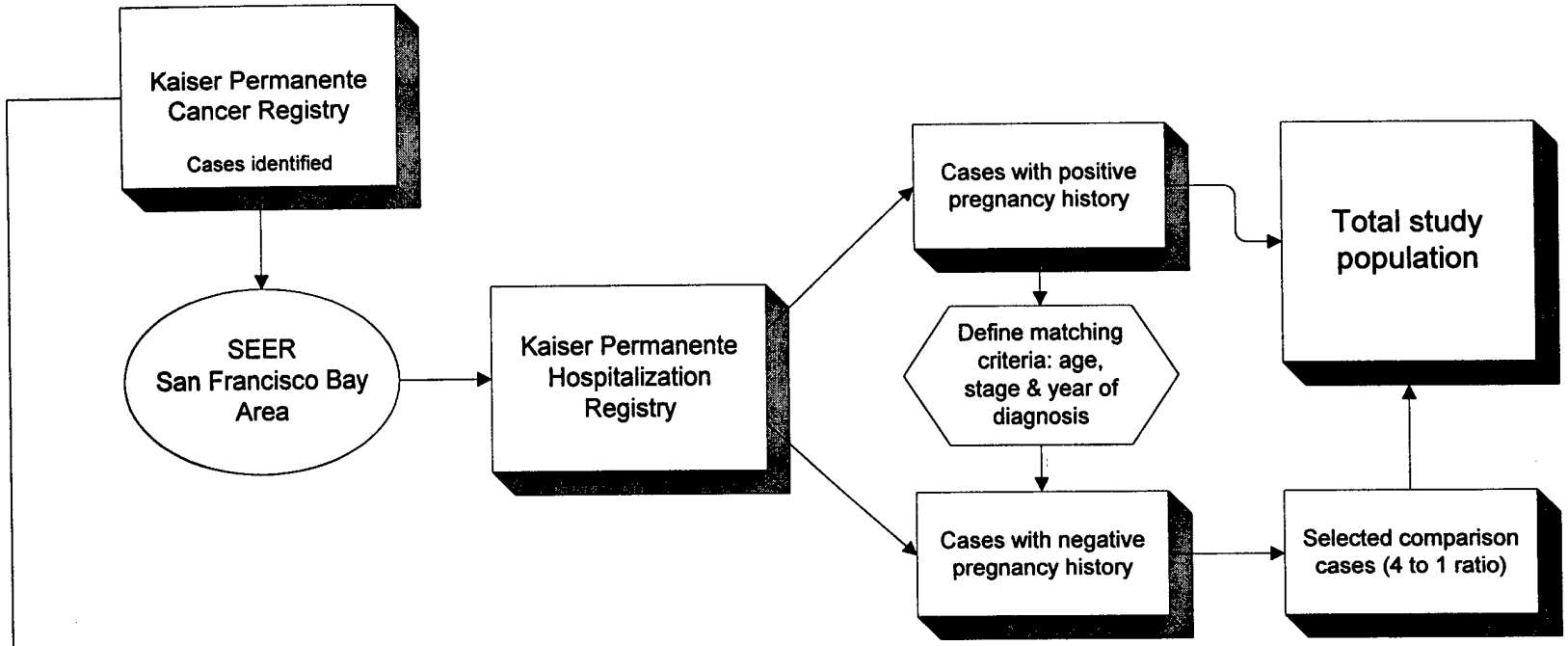
APPENDICES:

A. Figure 1: Current Status of Research Project

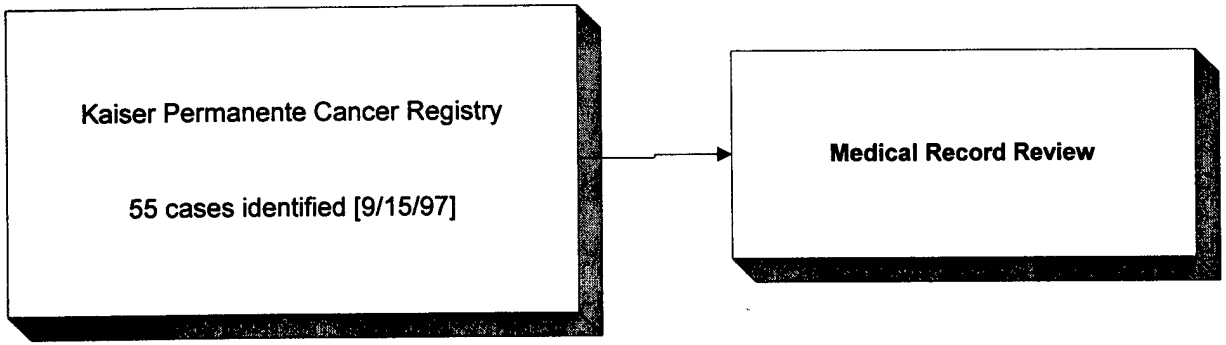
B. Kaiser Data Collection Instrument

Figure 1

Does Subsequent Pregnancy Influence Breast Cancer Survival?
Status of Research - September 1997



Current Status of Case Indentification & Record Review



BREAST CANCER STUDY
Medical Record Abstract Form

Date Reviewed:	Chart Locations	# of Volumes
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

1. **Name**_____
   last first
2. **Kaiser Medical Record Number** _ _ _ _ _ _ _ _ _
3. **Date of birth** _ __ __ _ _ _
   month day year
4. **Race** 1=Hispanic 7=White
   3=Asian 8=Other
   5=Black
5. **Primary Kaiser Facility** _ _ _

Does this women meet the criteria? (yes = 1, no = 2)

6. **Was diagnosis of breast cancer confirmed?** ____
7. **Age < 45 at time of Dx?** ____
8. **Is this woman able to become pregnant? (look for history of pelvic surgery before or after breast cancer dx and tx that affects fertility)** ____

If any of the answers to #6, #7, or #8 are "no", the woman is excluded from the study.

If all the answers to #6, #7, and #8 are "yes", continue the review.

MRN _ _ _ _ _ _ _ _ _

Cancer # 1

1. Date of first diagnosis of breast cancer: _ __ __ _ _ _ Height ___ft. _ _ inches
month day year Weight _ _ _ lbs.

2. Method of first detection:
   1. Self palpation
   2. Clinical exam
   3. Screening mammogram

3. Mammography:
   1. Negative
   2. Suspicious
   3. Not done
   4. Positive

4. *First* Breast Surgery:
   1. Mastectomy
   2. Lumpectomy/Local Excision

5. Axillary Dissection (first surgery):
   1. Yes
   2. No

6. *Second* Breast Surgery : date _ __ __ _ _ _
reason: 1. Residual month day year
   2. Reccurence

7. *Second* Breast Surgery (type):
   1. Mastectomy
   2. Lumpectomy/Local Excision

8 Axillary Dissection (second surgery):
   1. Yes
   2. No

9. Tumor size at diagnosis - Cancer #1
   Size _ _._(cm)

10. Tumor type:
   1. In situ
   2. Invasive

11. Lymph nodes:
   Total # removed/examined: _ _
   Total # positive: _ _

12. Tumor ER status - Cancer #1
   0 = Negative
   1 = Positive
   2 = Borderline
   9 = Not Available

MRN _ _ _ _ _ _ _ _ _

13. Tumor PR status - Cancer #1 :
    0 = Negative
    1 = Positive
    2 = Borderline
    9 = Not Available

14. Adjuvant Treatment of Cancer #1 (1 = Yes 2 = No)

    1. Radiation ____ if yes, Rads _ _ _ _

    2. Chemotherapy ____ if yes , Duration (months) _ _

    3. Hormone Therapy ____ if yes, Type _____

Cancer # 2 **If no second primary, SKIP to Qx #29**

15. Date of second primary diagnosis of breast cancer: _ __ __ _ _ _
    month day year

16. Method of first detection:
    1. Self palpation
    2. Clinical exam
    3. Screening mammogram

17. Mammography:
    1. Negative
    2. Suspicious
    3. Not done
    4. Positive

18. First Breast Surgery:
    1. Mastectomy
    2. Lumpectomy/Local Excision

19. Axillary Dissection (first surgery):
    1. Yes
    2. No

20. *Second* Breast Surgery date : _ __ __ _ _ _
    month day year
    reason: 1. Residual
    2. Reccurence

21. *Second* Breast Surgery (type):
    1. Mastectomy
    2. Lumpectomy\Local Excision

22. Axillary Dissection (second surgery):
    1. Yes
    2. No

MRN _ _ _ _ _ _ _ _ _

23. Tumor size at diagnosis - Cancer #2
    Size _ _._(cm)

24. Tumor type:
    1. In situ
    2. Invasive

25. Lymph nodes:
    Total # removed/examined: _ _
    Total # positive: _ _

26. Tumor ER status - Cancer #2
    0 = Negative
    1 = Positive
    2 = Borderline
    9 = Not Available

27. Tumor PR status - Cancer #2
    0 = Negative
    1 = Positive
    2 = Borderline
    9 = Not Available

28. Treatment after Cancer #2 (1 = Yes 2 = No)

    1. Radiation ____ if yes, Rads _ _ _ _

    2. Chemotherapy ____ if yes, Duration (months) _ _

    3. Hormone Therapy ____ if yes, Type _____

---

29. If evidence of recurrent breast cancer, date recurrence first detected: _ __ __ _ _ _
    month day year

30. Type of Recurrence
    1 = Local (skin, chest wall, remaining breast tissue after lumpectomy)
    2 = Regional (axillary nodes, superclavicular nodes)
    3 = Distant (bone, liver, lungs, etc.)

31. Family history of breast cancer at last Kaiser contact:
    1 = Primary family member with breast cancer (mother, sister, daughter)
    2 = Secondary relative with breast cancer (aunts, grandmother)
    3 = Both primary and secondary relatives with breast cancer
    4 = No family history

MRN _ _ _ _ _ _ _ _ _ _

32. Family history of ovarian cancer at last Kaiser contact:
    1 = Primary family member with ovarian cancer (mother, sister, daughter)
    2 = Secondary relative with ovarian cancer (aunts, grandmother)
    3 = Both primary and secondary relatives with ovarian cancer
    4 = No family history

Pregnancy history prior to first breast cancer diagnosis: Including live births, still births, tubal or other ectopic pregnancies, miscarriages and abortions.

33. Fertility tx with hormones?
    1 = Yes
    2 = No

34. Number of pregnancies: _ _
    (Not recorded in chart = 99, Unknown = 88, Never = 00)

If no prior pregnancies, SKIP to Subsequent Pregnancies

Outcomes:
1 = Live Birth - Term 2 = Live Birth but pre-term 3 = Still Birth 4 = Abortion
5 = Miscarriage 6 = Ectopic 7 = uncertain 8 = other _____

35. Prior Pregnancy #1 Outcome ___ _ _ \ _ _ _ _
    month year
    Newborn normal?
    1. yes
    2. no if no describe, _____ _ _ _ . _ _

36. Prior Pregnancy #2 Outcome ___ _ _ \ _ _ _ _
    month year
    Newborn normal?
    1. yes
    2. no if no describe, _____ _ _ _ . _ _

37. Prior Pregnancy #3 Outcome ___ _ _ \ _ _ _ _
    month year
    Newborn normal?
    1. yes
    2. no if no describe, _____ _ _ _ . _ _

38. Prior Pregnancy #4 Outcome ___ _ _ \ _ _ _ _
    month year
    Newborn normal?
    1. yes
    2. no if no describe, _____ _ _ _ . _ _

39. Prior Pregnancy #5 Outcome ___ __ ____ __ __ __
month year

Newborn normal?
1. yes
2. no if no describe, _____ ___.___

40. Prior Pregnancy #6 Outcome ___ __ ____ __ __ __
month year

Newborn normal?
1. yes
2. no if no describe, _____ ___.___

41. Prior Pregnancy #7 Outcome ___ __ ____ __ __ __
month year

Newborn normal?
1. yes
2. no if no describe, _____ ___.___

42. Prior Pregnancy #8 Outcome ___ __ ____ __ __ __
month year

Newborn normal?
1. yes
2. no if no describe, _____ ___.___

MRN _ _ _ _ _ _ _ _ _

Pregnancy history **subsequent** to first breast cancer diagnosis: Including live births, still births, tubal or other ectopic pregnancies, miscarriages and abortions.

43. Fertility tx with hormones?
    1 = Yes
    2 = No

44. Number of pregnancies: _ _
    (Not recorded in chart = 99, Unknown = 88, Never = 00)
    ****If ♀ had a tubal ligation or a hysterectomy after any subsequent pregnancy, continue and also complete Qx #53.**

If no **subsequent** pregnancies, SKIP to next page

Outcomes:
1 = Live Birth - Term 2 = Live Birth but pre-term 3 = Still Birth 4 = Abortion
5 = Miscarriage 6 = Ectopic 7 = uncertain 8 = other _____

45. Subsequent Pregnancy #1 Outcome ___ _ _ \ _ _ _ _
    month year
    Newborn normal?
    1. yes
    2. no if no describe, _____ _ _ _ . _ _

46. Subsequent Pregnancy #2 Outcome ___ _ _ \ _ _ _ _
    month year
    Newborn normal?
    1. yes
    2. no if no describe, _____ _ _ _ . _ _

47. Subsequent Pregnancy #3 Outcome ___ _ _ \ _ _ _ _
    month year
    Newborn normal?
    1. yes
    2. no if no describe, _____ _ _ _ . _ _

48. Subsequent Pregnancy #4 Outcome ___ _ _ \ _ _ _ _
    month year
    Newborn normal?
    1. yes
    2. no if no describe, _____ _ _ _ . _ _

MRN _ _ _ _ _ _ _ _ _ _

49. Date of last Kaiser Contact _ __ __ _ _ _
month day year

50. Status at last contact
1 = Alive - free of disease
2 = Alive - recurrent disease
3 = Dead from breast cancer
4 = Dead from cause other than breast cancer
5 = Dead, unable to determine cause

51. Date of Death: _ __ __ _ _ _
52. Kaiser patient currently? (1 = yes 2 = no)
If no, any forwarding imformation?

_____

_____

_____

53. Date of Tubal Ligation or Hysterectomy: _ __ __ _ _ _